$2^n$ external output ports labeled with $2^n$ distinct binary output addresses in the form of $b_1b_2...b_n$, and composed of a plurality of switching cells interconnected into a k-stage bit-permuting network which is characterized by the guide $\gamma(1), \gamma(2), \ldots, \gamma(k)$ where $\gamma$ is a mapping from the set $\{1, 2, \ldots, k\}$ to the set $\{1, 2, \ldots, n\}$, each of the packets destined for a rectangular set of output addresses represented by a quaternary sequence $Q_1, Q_2, \ldots, Q_n$, where each $Q_j$ is a quaternary symbol in any one of the three values: '0-bound', '1-bound', and 'bicast', wherein each of the switching cells is a sorting cell associated with the partial order "'0-bound' $\prec$ 'bicast' $\prec$ '1-bound'", includes: (a) generating the routing tag $Q_{\gamma(1)}Q_{\gamma(2)}...Q_{\gamma(k)}$ for each of the packets with reference to the guide of the bit-permuting network and the destination output addresses of the packet; and (b) routing each of the packets through the network by using $Q_{\gamma(j)}$ in the routing tag of the packet in the j-th stage cell, $1 \leq j \leq k$, to select an output or both outputs from the j-th stage cell to emit the packet.

In accordance with a system aspect of the present invention, a $2^n \times 2^n$ self-routing switch includes: (a) an array of $2^n$ external input ports and an array of $2^n$ external output ports with $2^n$ distinct binary output addresses in the form of $b_1b_2...b_n$ for routing a packet, the packet being either a real data packet destined for a rectangular set of output addresses represented by a quaternary sequence $Q_1, Q_2, \ldots, Q_n$, where each $Q_j$ is a quaternary symbol having one of the values of '0-bound', '1-bound' or 'bicast', or being an idle packet having no pre-determined destination output address; (b) a switching fabric having a plurality of switching cells interconnected into a k-stage bit-permuting network which is characterized by the guide $\gamma(1), \gamma(2), \ldots, \gamma(k)$, where $\gamma$ is a mapping from the set

{1, 2, ... , k} to the set {1, 2, ... , n}; (c) routing tag circuitry, coupled to the external input ports, for generating a routing tag $Q_{\gamma(1)}Q_{\gamma(2)}...Q_{\gamma(k)}$ for the packet with reference to the guide of the bit-permuting network and the destination addresses of the packet; and (d) routing control circuitry, coupled to the switching cells, for routing the packet through the switch by using $Q_{\gamma(j)}$ in the routing tag in the j-th stage cell, $1 \leq j \leq k$, to select an output or both outputs from the j-th stage cell to emit the packet.--.

Please replace lines 1-3 on page 13 as follows: --

FIG. 21B depicts a (1 2 3) permutation on an 8×8 exchange;

FIG. 21C depicts a (3 1) permutation on an 8×8 exchange;

FIG. 21D depicts a combined (1 4)(2 3) permutation on an 8×8 exchange;--.

Page 206, replace line 13 with --100101, 100111, 101101, and 101111, so this is a 3-dimentional rectangle. The number of--.

Page 210, replace line 2 with -- $p_1...p_r$ serves as the tiebreaker when the two packets arrived at the same cell are both 0-bound or both 1-bound.--.

Please replace page 231, namely, the "Abstract of the Disclosure", with the following:

--ABSTRACT OF THE DISCLOSURE

A self-routing multicast switching network composed of bicast cells interconnected as a bit-permuting network and, in particular, as a banyan-type network, and the concomitant general self-routing control mechanism for multicasting the packets